Office, and of several cooperating friends in South America.

The precipitation on the coast of Peru during 1925 has been recorded as certainly the heaviest since 1891; but there are reasons for believing that the conditions have not been paralleled during the course of at least six centuries. Prior to March, 1925, for example, the mud walls of the prehistoric fortress of Chan Chan, near Trujillo, still bore clearly the ancient reliefs and hieroglyphics of their builders, but the rainfall of a few subsequent weeks entirely obliterated them. The destruction of life in the sea, through a process which the writer has elsewhere described, was also unprecedented within human memory. Under date of January 30, 1926, Mr. Francisco Ballén, director of the Peruvian National Guano Administration, writes that probably two-thirds of the sea-bird population of the Peruvian coast, as existing in December, 1924, perished during the following months of unfavorable oceanic conditions.

Fortunately the serious economic effects of the countercurrent and its sequelae have simplified the study of meteorological and oceanographic problems by encouraging the recording of precise data. Through the interest of the American ambassador in Lima, of Maj. Otto Holstein, of Trujillo, and of other friends and correspondents in the service of numerous Peruvian industrial organizations, tabulated records of the climatic and oceanic régime are now being received regularly. These are deposited in the files of the American Geographical Society of New York, and their subsequent interpretation can not fail to go far toward illuminating our faint understanding of one of the most remarkable geographic phenomena of our time.—*Robert C. Murphy.*

NOTES AND ABSTRACTS

E. W. BLISS ON BRITISH WINTERS IN RELATION TO WORLD WEATHER

The author in continuance of his previous work on correlation of world weather correlates the mean winter temperatures of Greenwich with elements of the weather in various parts of the world.

The correlation coefficients with pressure, temperature, and rainfall in various quarters of the earth are shown in the exhibit below.

Number of coefficients 0.4 or greater

	Preceding quarter	Contemporary quarter	Succeeding quarters
Pressure	1	4	0
Temperature	8	6	3
Rainfall, etc.	1	1	1

Ten of these coefficients are with the two preceding quarters, eleven with the one contemporary quarter and four with the two subsequent quarters. The large coefficients are therefore mainly with previous and contemporary quarters. The author concludes as follows:

Out of 310 correlation coefficients with Greenwich temperature of December to February as representing winter in Northwest Europe the largest appear to indicate the following relationships—

(1) With pressure of the previous summer at Cairo.

(2) With temperature of the previous June to August at Madras, Samoa, Batavia, and Perth.

(3) With the previous Nile flood, the relationship here being inverse.

The results indicate that conditions in the Southern Hemisphere play a part comparable with that of the North Atlantic oscillation in controlling subsequent winter weather in the British Isles.—*A. J. H.*

AEROLOGICAL WORK IN JAPAN[1]

This is the first published report of the Japanese Aerological Observatory at Tateno, where there is maintained a most complete meteorological equipment, including facilities for making aerological observations by means of pilot balloons, kites, sounding balloons, and captive balloons. This report contains data procured by double-theodolite pilot balloon observations only. The records cover two years (March, 1923–February, 1925) and total 1,030 observations. The balloons used weighed from 10 to 120 grams and the rates of ascent varied between 100 and 350 meters per minute.

There are included in the report a very complete history and description of the station, equipment, etc. Tables showing the wind velocity and direction at the various altitudes for successive minutes are given for each pilot balloon observation. Graphs are included, showing the:

Mean wind velocity (0–10 km.) for each season and for the year.

Mean annual wind velocity (0–2 km.) for 6 a. m., 10 a. m., and 2 p. m.

Mean wind direction (0–10 km.) for each season.

Mean wind direction (0–2 km.) for 6 a. m., 10 a. m., and 2 p. m. for each season.

Frequency of wind directions (0–10 km.) for each season.

Frequency of wind directions (0–2 km.) for 6 a. m., 10 a. m., and 2 p. m. for each season.

The report closes with a discussion of the agreement between the observed ascensional rates of pilot balloons and those determined by formula. A change in the formula was made in order to obtain a closer agreement with the average observed rates. Closer agreement was found to obtain between the observed rates and those computed from the formula used by the U. S. Weather Bureau than those indicated by the Dines's formula.

Among the conclusions cited are the following:

1. The observed rates were found to be generally greater than those computed from formula. (U. S. Signal Corps and Dines).

2. For the rate of 100 m/m the values almost coincide but the actual rate becomes 20% greater for rates of 200 m/m.

3. The following new formula was devised to obtain closer agreement with the observed data.

$$V = 74.6\left\{\frac{A}{(A+B)^{2/3}}\right\}^{\frac{1}{1.53}}$$

This fits closely for the stratum 1 to 3 km. but to reduce the values computed from the above formula to the mean observed values from 1 to 10 km. they must be multiplied by the factor $\frac{1000}{1071} = 0.934$.

4. The rate of ascent is greatest at 2 p. m. and least at 6 a. m. It is greater in winter than in summer.

5. The rate is greatest near the ground and decreases more and more upward but at 8 km. it increases again.

[1] Abstract of "Roporto de la Aerologia Observatorio de Tateno. Nol. By W. Oishi. (The report was translated by Mr. W. W. Reed from the original Esperanto.)

6. The increase near the ground is due to convection, turbulence, and somewhat to topographical influence.

It is extremely gratifying to know that such an excellently equipped station is being maintained, and future reports on the results of the various other branches of the work will be awaited with the greatest interest.—*L. T. S.*

THE ROYAL METEOROLOGICAL SOCIETY'S "RAINFALL ATLAS OF THE BRITISH ISLES"

The extent to which amateurs with an interest in the weather can supplement, or, indeed, make possible, a scientific work of great importance, is illustrated by this atlas. The British Rainfall Organization is composed of such amateurs. In the course of its long history it has enlisted the cooperation of some 10,000 voluntary observers. Its records placed at the disposal of the committee of the Royal Meteorological Society directing the preparation of the atlas the accumulated data from some 3,000 stations. This is an average of about one station to every 40 square miles, in an area three quarters the size of California.

The maps are beautifully printed in colors, and are as follows:

1. A generalized topographic map showing principal towns, the county boundaries, and chief rivers.
2. Average annual rainfall (35-year period, 1881–1915).
3. Rainfall of the wettest year (1872).
4. Rainfall of the driest year (1887).
5. Annual rainfall as percentage of the average of 1881–1915, for each year from 1868 to 1923, inclusive.
6. Twelve monthly rainfall maps.

Dr. Hugh Robert Mill contributes a very full introduction, describing the history of the British Rainfall Organization, briefly summarizing the facts shown by the maps of rainfall distribution, and presenting several tables.

Of the tables, that showing "Areas of the different rainfall zones over the British Isles" is of particular interest, the zones being the areas between limiting isohyets. In variation of rainfall from region to region, the British Isles rival our west coast States. Fifty-three square miles, mostly along the northern shore of the Thames estuary, have annually less than 20 inches, while 22 square miles of mountain country in northern Wales, northern England, and western Scotland average over 150 inches annually. Slightly more than 1,000 square miles have over 100 inches, and roughly one-fourth of the total area of the British Isles have 30 inches or less.

A table of percentage variations of annual rainfall, 1868–1923, brings out the fact that in 73 per cent of the years the generalized average rainfall for the British Isles has departed only 10 per cent or less from the normal, and in 87 per cent the departure has been 15 per cent or less.

To discuss at length the information embodied in this splendid work is quite beyond the scope of the present notice. The atlas is surely a fitting monument to the labors of Symons who organized and for many years directed the British Rainfall Organization, and to the zeal with which his successors, Wallis, Mill, and Salter have carried the work forward.—*B. M. V.*

THE RAINFALL OF FLORIDA

By GRAGG RICHARDS

[Author's abstract of a dissertation submitted to the Graduate Board of Clark University, Worcester, Mass., in partial fulfillment of the requirements for the degree of doctor of philosophy. The full text, with charts, may be consulted in the library of Clark University]

In presenting graphically the rainfall of Florida the standard methods, such as those used by Kincer for the United States, have been used. The data available for the 30-year period 1895–1924 are from 88 stations within the State, with records of 5 years or over, those covering less than the entire 30 years being adjusted to that basis.

While the range of mean annual rainfall for 30-year stations is from 57.88 inches at Pensacola to 37.19 inches at Key West, adjusted stations indicate values as extreme as 70.2 inches at Molino (16 years) and 32.1 inches at Sand Key (12 years). Except for the interior of the peninsula and the region of the keys, the mean annual rainfall is over 50 inches.

The mean of Florida as a unit, weighted by area from the chart of mean annual rainfall, is 53 inches, with 89.5% of its area receiving between 45 and 60 inches.

During the 30-year period all parts of the State, except the keys, have received over 60 inches in some years, while over 90 inches has been recorded at stations in west Florida and on the southeastern and western coasts of the peninsula. Minimum records also tend to be less on the coast than in the interior, varying, in general, from 30 to 40 inches.

For all of Florida more than half of the annual rainfall is in the half year April–September, varying from a nearly equal division in west Florida to over 70% in the southwestern part of the peninsula.

For the State as a whole, 19% of the mean annual rainfall occurs in spring, 40% in summer, 24% in autumn, and 17% in winter, but the actual distribution varies greatly with location. The southwestern coast of the peninsula receives nearly half of its precipitation in summer, while the southeast coast has heavier rainfall in autumn than summer, with over 35% of the annual amount. Extreme seasonal values vary from 48.33 inches, for New Smyrna, in an autumn (1924), to 0.17 inch, for a winter season (1906–1907), at Orlando.

All stations in Florida have a mean rainfall of not less than 6 inches in some months, the maximum varying from July in west Florida to October at points on the east coast. November is generally the month with least mean rainfall. All stations record less than 3.5 inches, as a mean, for some months, many between 1.5 and 2 inches.

New Smyrna has recorded the highest absolute maximum monthly rainfall with 39.08 inches, while Pensacola has a high record of but 18.58 inches, and Key West of but 16.99 inches. Practically all of Florida has experienced a rainless month at some time during the period, though the lowest record for Brooksville is 0.10 inch.

Mean monthly rainfall data have been used for showing rainfall types. For this purpose, Ward, showing actual means, rather than Kincer, with monthly proportions of annual rainfall, has been followed, thus giving an idea of actual amounts, as well as proportions, in a single graph.